

REMARKS/ARGUMENTS

In the Office Action mailed January 23, 2009, claims 1, 3 – 5, 7, 10 – 16, 18, and 23 were rejected. In response, Applicants have amended claims 1, 7, and 18, canceled claim 10, and added new claims 24 and 25. Applicants request reconsideration of the application in view of the claim amendments and the below-provided remarks.

Response to Claim Rejections

Claims 1 and 3 – 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (U.S. Pat. No. 4,184,767, hereinafter Hughes) in view of Mocker et al. (U.S. Pat. No. 5,128,794, hereinafter Mocker). Additionally, claims 7 and 10 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Mocker and further in view of Washington (U.S. Pat. No. 6,031,613). However, Applicants respectfully submit that the pending claims are patentable over the cited prior art for the reasons provided below.

Claims 1 and 7

Claim 1 has been amended to remove the limitations related to rotating polarization state and to particularly point out that the EM beams are elliptical shaped EM beams as recited in claim 10 (now canceled). As amended claim 1 recites:

“A method for determining the position of an object, comprising:
 providing at least two electromagnetic (EM) beams, said at least two EM beams being provided from two different EM sources;
 dispersing said at least two EM beams, respectively, into a scanning space by frequency;
 retro-reflecting at least a portion of said respective dispersed beams off an object positioned within said scanning space;
 determining, in response to frequencies associated with said retro-reflected beams, respective angular positions of said object;
 triangulating coordinates of said object using two or more of said respective angular positions;
 wherein said at least two EM beams are elliptical shaped EM beams so as to improve tracking range of said retro-reflective object along a direction orthogonal to said scanning space, wherein the elliptical shaped EM beams are EM beams that have an elliptical shaped beam spot.” (emphasis added)

Claim 7 has been amended to incorporate the limitations of claim 10 and to remove the “at least two partially reflective surfaces...” Claim 10 has been canceled. As amended, claim 7 recites:

“A position determination system, comprising:
at least two electromagnetic (EM) sources that provide EM beams;
at least two beam dispersion devices that respectively disperse said at least two EM beams into a scanning space by frequency, wherein said system is configured to be responsive to a retro-reflective object positioned within said scanning space such that said retro-reflective object retro-reflects, at least a portion of said respective dispersed beams;
at least two receptors that receive said respective retro-reflected beams and provide signals for determining respective angular positions of said retro-reflective object; and
a processor, in signal communication with said at least two receptors, that determines, in response to frequencies associated with said respective retro-reflective beams, said respective angular positions of said retro-reflective object; wherein said processor triangulates coordinates of said retro-reflective object using at least two of said respective angular positions; and
wherein said at least two EM sources provide elliptical shaped EM beams so as to improve tracking range of said retro-reflective object along a direction orthogonal to said scanning space, wherein the elliptical shaped EM beams are EM beams that have an elliptical shaped beam spot.” (emphasis added)

According to amended claims 1 and 7, the at least two EM beams are elliptical shaped EM beams that have an elliptical shaped beam spot.

In the Office action, the support for the rejection of claim 10 is:

“Hughes discloses (col. 4, lines 30 – 55) shows in figure 4, adjusting the orientation of the polarization of the beam to elliptical polarization.” (emphasis added) (Office action, page 6, item 17)

While Hughes teaches elliptically polarized light with reference to Fig. 4, Hughes does not teach EM beams with an elliptical shaped beam spot that helps to improve the tracking range along a direction orthogonal to the scanning space as recited in amended claim 10. Hughes teaches about the shape of the polarization state of a beam while claims 1 and 7 specify the shape of the beam spot of a beam. As is known in the field of optics, the polarization state of a light beam does not necessarily determine the shape of the beam spot that is made by the light beam. In particular, elliptically polarized light does not necessarily correspond to an elliptical shaped beam spot. Hughes is silent as to the shape of the beam spot that is made by the elliptically polarized light in Fig. 4.

Because Hughes does not teach EM beams having an elliptical shaped beam spot, Applicants assert that a *prima facie* case of obviousness has not been established with respect to amended claims 1 and 7.

Dependent Claims 3 – 5 and 10 – 16 and 18

Claims 3 – 5 are dependent on claim 1 and claims 10 – 16 and 18 are dependent on claim 7. Applicants respectfully assert that claims 3 – 5, 10 – 16, and 18 are allowable at least based on allowable base claims.

Claim 23

Claim 23 includes limitations similar to claims 1 and 7. In particular, claim 23 recites elliptical shaped EM beams that have an elliptical shaped beam spot. Because claim 23 includes similar limitations to claim 1 and 7, Applicants assert that the remarks provided above with regard to claims 1 and 7 apply also to claim 23.

New claims 24 and 25

Claim 24 is the same as previously presented dependent claim 6 (presented in the response filed April 18, 2008) and claim 25 is the same as previously presented dependent claim 17 (presented in the response filed April 18, 2008). The limitations of new claim 24 are the same as the limitations that are removed from claim 1 in the current amendment and the limitations of new claim 25 are the same as the limitations that are removed from claim 7 in the current amendment. Applicants respectfully assert that new claims 24 and 25 are allowable at least based on allowable base claims.

CONCLUSION

Applicants respectfully request reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account **50-3718** pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account **50-3718** under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Respectfully submitted,

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